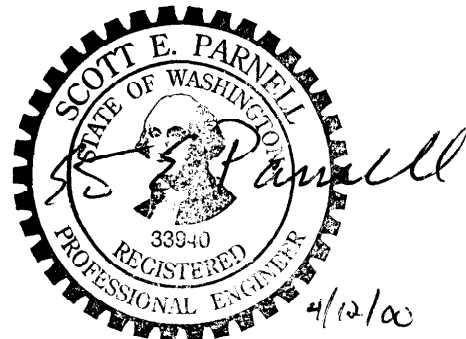


# EXHIBIT E

## TECHNICAL SPECIFICATION


### FOR THE

### SURVEY STATION



**BHI-DIS** 957 4/19/2000

EXPIRES: 3/20/02

1	4/13/00	Issued for Construction	SEP	KEC	Ops	FMC
0	12/02/99	Issued for Bid	SEP	KEC	JAG	FMC
REV	DATE	REASON FOR REVISION	ORIGINATOR	CHECKER	GROUP SUPVR	PROJECT ENGR/DES
		<b>RICHLAND ENVIRONMENTAL RESTORATION PROJECT</b>	JOB NO. 22192			
			SPECIFICATION NO. 0100N-SP-M0014			
			SHEET 1 of 9			

**TECHNICAL SPECIFICATION**  
**FOR THE**  
**SURVEY STATION**

**Contents**

1.0	GENERAL .....	3
1.1	SUMMARY .....	3
1.2	ABBREVIATIONS .....	3
1.3	CODES, STANDARDS, LAWS, AND REGULATIONS .....	3
1.4	TECHNICAL SUBMITTALS .....	4
1.5	DEFINITIONS .....	4
	1.5.1 Construction Drawings.....	4
	1.5.2 Project Drawings.....	4
2.0	MATERIALS AND EQUIPMENT .....	4
2.1	GENERAL .....	4
2.2	EQUIPMENT REQUIREMENTS .....	5
2.3	ELECTRICAL AND MECHANICAL REQUIREMENTS.....	6
3.0	EXECUTION .....	6
3.1	FIELD OPERATIONS/SERVICES .....	6
3.2	ERECTION/INSTALLATION PROCEDURES .....	7
3.3	TESTING AND CERTIFICATION.....	7
3.4	VERIFICATION OF COMPLIANCE .....	7
3.5	QUALITY ASSURANCE/QUALITY CONTROL.....	7
4.0	CLEAN-UP .....	8
5.0	YEAR 2000 WARRANTY .....	8
	Attachment 1 Surface Radioactivity Values.....	9

## **TECHNICAL SPECIFICATION FOR THE SURVEY STATION**

### **1.0 GENERAL**

#### **1.1 SUMMARY**

This specification establishes quality and workmanship requirements and defines how quality is measured for the portable Survey Station specified herein and in applicable Subcontract requirements. Reference is directed to Exhibit "D," Scope of Work, for specific services required.

#### **1.2 ABBREVIATIONS**

The abbreviations listed below, as used in this specification, shall have the following meanings:

ALARA	as low as reasonably achievable
ASCE	American Society of Civil Engineers
ERDF	Environmental Restoration Disposal Facility
HEPA	High Efficiency Particulate Air
NFPA	National Fire Protection Association
OSHA	Occupational Safety and Health Administration
PVC	polyvinyl chloride
QA/QC	Quality Assurance/Quality Control
RCT	radiological control technician
SSRS	Subcontractor Submittal Requirements Summary

#### **1.3 CODES, STANDARDS, LAWS, AND REGULATIONS**

Unless otherwise approved or shown, the following codes, standards, laws, and regulations of the latest issue at the time of the bid shall apply to establish minimum requirements for the Survey Station. Referenced test methods, specifications, and recommended practices are to be used to verify material properties and identify acceptable practices. Failure to identify applicable codes or standards does not negate the requirement to be knowledgeable of or to comply with applicable codes, standards, laws, and regulations.

ASCE 7	American Society of Civil Engineers, Minimum Design Loads for Buildings and Other Structures
NFPA 101	Life Safety Code
NFPA 101	National Fire Protection Association
WAC	Washington Administrative Code

#### 1.4 TECHNICAL SUBMITTALS

All required submittals stated herein or elsewhere in this specification shall be submitted to the CONTRACTOR in accordance with Exhibit "I," Subcontractor Submittal Requirements Summary (SSRS). Submittals that do not meet the project requirements will be rejected. Rejected submittals shall be resubmitted in a timely manner.

#### 1.5 DEFINITIONS

##### 1.5.1 Construction Drawings

Drawings and/or shop drawings supplied by SUBCONTRACTOR and used for construction.

##### 1.5.2 Project Drawings

Drawings supplied by CONTRACTOR and contained in Exhibit "F".

#### 2.0 MATERIALS AND EQUIPMENT

##### 2.1 GENERAL

A portable (to be removed at end of project) Survey Station shall be provided for identifying and removing radioactive contamination found on vehicles, containers, equipment, and other items. Attachment 1 provides the standards for release for radioactive shipment and free release that shall be met. For release for shipment, values listed as "Removable," shall be met on exterior surfaces. For free release, values listed under both "Removable" and "Total" shall be met on all surfaces.

The portable Survey Station shall provide all-weather protection so that containers and equipment may be presented for survey in an environment free of snow, ice, water, and mud. The Survey Station shall provide workers shelter from the sun, wind, and rain, and provide provision to maintain radiological survey instrumentation between 4.5°C and 40.5°C during operations. All components within the structure shall be protected from freezing down to an ambient temperature of -24°C with a 6.7 m/s wind.

All materials and equipment shall be new, unused, suitable, and rated for the service intended.

The reliability and quality of components and systems provided shall be evaluated to ensure optimized operation. The operating philosophy shall be evaluated based on the ability to maintain the workers exposure to environmental, industrial, and radiological hazards as low as reasonably achievable (ALARA).

## 2.2 EQUIPMENT REQUIREMENTS

Structures or tents used for weather protection shall be designed in accordance with the American Society of Civil Engineers (ASCE) 7. Temporary structures or tents shall be capable of withstanding sustained wind speed of 31.4 m/s and 38.1 m/s peak gusts, exposure Category C, with importance factor 1.0, Seismic Zone 2B, with importance factor 1.25. Temporary structures or tents shall be designed for snow loading not less than 122 kg/m<sup>2</sup> in accordance with *Washington Administrative Code* (WAC) 296-150A-300.

Fabric structures shall consist of membrane installed over tubular steel frame members and tensioned both vertically and horizontally to prevent wear and abrasion. Vertical stretch shall be maintained mechanically with tension bars that require no ongoing maintenance.

The structure supplier shall provide all materials and methods to fully tension and seal the exterior fabric material around all doors, ventilation, and other required openings. Seals around openings shall present a neat and finished appearance and eliminate any loose materials that could be damaged by flapping or abrasion.

The membrane material shall be flame resistant polyvinyl chloride (PVC) coated polyester fabric with a minimum-coated weight of 680 g per square meter. The fabric shall be formulated to resist ultraviolet rays, moisture, cold cracking, and mildew. The material shall be selected from the manufacturer's standard colors for the side walls and be translucent white in the roof area.

Provide an identification sign that reads "SURVEY STATION" for each end of the structure. Lettering shall be clearly legible from a distance of 20 m.

Dry storage space for survey instruments and supplies shall be provided where surveying and decontamination activities occur.

Adequate ventilation shall be provided to prevent the accumulation of exhaust and fumes from container handling vehicles, earthwork equipment, and other equipment, as applicable. The ventilation system shall incorporate ductwork, which will draw engine exhaust out of the surveying station. The duct connection should be positioned

immediately above the location of the truck's exhaust stack where the truck stops in the station.

Work platforms shall be provided that allow access to all container/equipment surfaces for decontamination and radiological survey purposes. Heavy-duty slip resistant work platforms with railings and access stairs shall be provided, as shown on the Project Drawings. All equipment shall be Occupational Safety and Health Administration (OSHA) compliant.

SUBCONTRACTOR shall submit for approval and maintain on site records available for review at any time the following items:

- Manufacturer's descriptive literature (e.g., catalog cuts, material and/or component specification information, handling instructions, verification that materials provided comply with specification requirements)
- Shop drawings (layout and detailed, as applicable)
- Structural calculations stamped by a professional engineer registered in Washington State (as an equivalent, verification, including calculations, that manufactured components have been reviewed by a registered professional engineer and meet or exceed the design requirements stated in the Subcontract Document)
- Assembly/erection instructions
- Start-up plan and maintenance (including recommended spare parts list).

### 2.3 ELECTRICAL AND MECHANICAL REQUIREMENTS

Electrical and mechanical requirements shall be as specified in Technical Specification 0100N-SP-E0017, and as shown on the Project Drawings.

## 3.0 EXECUTION

### 3.1 FIELD OPERATIONS/SERVICES

Provide all materials, labor, and services required to construct, operate, and maintain the Survey Station. Upon completion of remediation activities, the station shall be disassembled and removed.

Survey Station operation shall be such that cross contamination of surrounding areas does not occur.

If a high efficiency particulate air (HEPA) vacuum is used (limited to 1 unit), SUBCONTRACTOR shall bag and weigh the collected waste. SUBCONTRACTOR shall document results and provide information to the CONTRACTOR. The bagged waste shall be delivered to the radiological control technician (RCT) for measurement of activity level. SUBCONTRACTOR shall then notify CONTRACTOR prior to disposal of bagged material into an Environmental Restoration Disposal Facility (ERDF) container.

### 3.2 ERECTION/INSTALLATION PROCEDURES

Installation and assembly procedures shall be in accordance with the manufacturer's instructions and recommendations. Equipment shall be installed in accordance with the manufacturer's instructions. A copy of the manufacturer's instructions shall be available for review at all times on the jobsite.

### 3.3 TESTING AND CERTIFICATION

Tests and inspections shall be performed by the SUBCONTRACTOR to establish that all installed systems operate properly and conform to the Subcontract Document. Completed documentation confirming test and inspection results shall be maintained on site and be available for review by the CONTRACTOR.

### 3.4 VERIFICATION OF COMPLIANCE

Prior to use of the Survey Station, submit written verification that the facility complies with the specifications contained in this section, has been tested to fully verify that it functions as intended, and that the on site records have been completed.

### 3.5 QUALITY ASSURANCE/QUALITY CONTROL

Establish and maintain an approved Quality Assurance/Quality Control (QA/QC) Program, in accordance with Exhibit "A," Quality Assurance Program, to assure compliance with Subcontract requirements and shall maintain records of QC for all operations. The program shall describe the system(s) for planning, performing, and assessing work that ensures materials, systems, results, and personnel meet stated quality, technical, and performance objectives. All activities related to surveying and decontamination shall conform to stated quality, technical, and performance objectives of the approved QA Program.

#### 4.0 CLEAN-UP

All unused material and debris resulting from the work shall be removed following the completion of work. The work area shall be maintained daily in a clean and orderly fashion during construction activities.

#### 5.0 YEAR 2000 WARRANTY

Any computer application or system or equipment provided under this specification shall be Year 2000 Compliant. As used in this warranty, the term "Year 2000 Compliant" means that the Product, when configured and used according to the documented instructions will without manual intervention or interruption:

- a. Correctly handle and process date information before, during, and after January 1, 2000, accepting date input, proving date output and performing calculations, including, but not limited to, sorting and sequencing, on dates or portions of dates;
- b. Function according to the documentation during and after January 1, 2000, without changes in operation resulting from the advent of the new century;
- c. Where appropriate, respond to two-digit date input in a way that resolves any ambiguity as to century in a disclosed, defined, and predetermined manner;
- d. Store and provide input of date information in ways that are unambiguous as to century; and
- e. Manage the leap year occurring in the year 2000, following the quad-centennial rule. The "quad-centennial rule" means (a) if the year is divisible by 4, it is a leap year, UNLESS (b) the year is also divisible by 100, then it is not a leap year, UNLESS (c) the year is also divisible by 400, then it is a leap year.



**Attachment 1: Appendix D to 10 CFR Part 835 - Surface Radioactivity Values  
(Standards for Release)**

Nuclide Surface Radioactivity Values <sup>1</sup> : in dpm/100 cm <sup>2</sup>	Removable <sup>2,4</sup>	Total (fixed + removable) <sup>2,3</sup>
U-nat, U-235, U-238, and associated decay products	1000	5000
Transuranics, Ra-226, Ra-228, Th-230, Th-228, Pa-231, Ac-227, I-125, I-129	20	500
Th-nat, Th-232, Sr-90, Ra-223, Ra-224, U-232, I-126, I-131, I-133	200	1000
Beta-gamma emitters (nuclides with decay modes other than alpha emission or spontaneous fission) except Sr-90 and others noted above. <sup>5</sup>	1000	5000
Tritium Organic Compounds; surface contaminated by HT, HTO, and metal tritide aerosols.	10,000	N/A

- 1 The values in the appendix apply to radioactive contamination deposited on, but not incorporated into the interior of, the contaminated item. Where surface contamination by both alpha- and beta-gamma-emitting nuclides exists, the limits established for alpha- beta-gamma-emitting nuclides should apply independently.
- 2 As used by this table, dpm (disintegrations per minute) means the rate of emission by radioactive material as determined by correcting the counts per minute observed by an appropriate detector for background, efficiency, and geometric factors associated with the instrumentation.
- 3 The levels may be averaged over one square meter provided the maximum surface activity in any area of 100 cm<sup>2</sup> is less than three times the value specified. For purposes of averaging, any square meter surface shall be considered to be above the activity guide G if: (1) From measurements of a representative number n of sections it is determined that  $1/n \cdot \sum S_i \leq G$ , where  $S_i$  is the dpm/100 cm<sup>2</sup> determined from measurement of section I; or (2) it is determined that the sum of the activity of all isolated spots or particles in any 100 cm<sup>2</sup> area exceeds 3G.
- 4 The amount of removable radioactive material per 100 cm<sup>2</sup> of surface area should be determined by swiping the area with dry filter of soft absorbent paper, applying moderate pressure, and then assessing the amount of radioactive material on the swipe with an appropriate instrument of known efficiency. (Note -- The use of dry material may not be appropriate for tritium.) When removable contamination on objects of surface area less than 100 cm<sup>2</sup> is determined, the activity per unit area should be based on the actual area and the entire surface should be wiped. Except for transuranics and Ra-228, Ac-227, Th-228, Th-230, Pa-231, and alpha emitters, it is not necessary to use swiping techniques to measure removable contamination levels if direct scan surveys indicate that the total residual surface contamination levels are within the limits for removable contamination.
- 5 This category of radionuclides includes mixed fission products, including Sr-90 which is present in them. It does not apply to Sr-90, which has been separated from other mixed fission products or mixtures where the Sr-90 has been enriched.